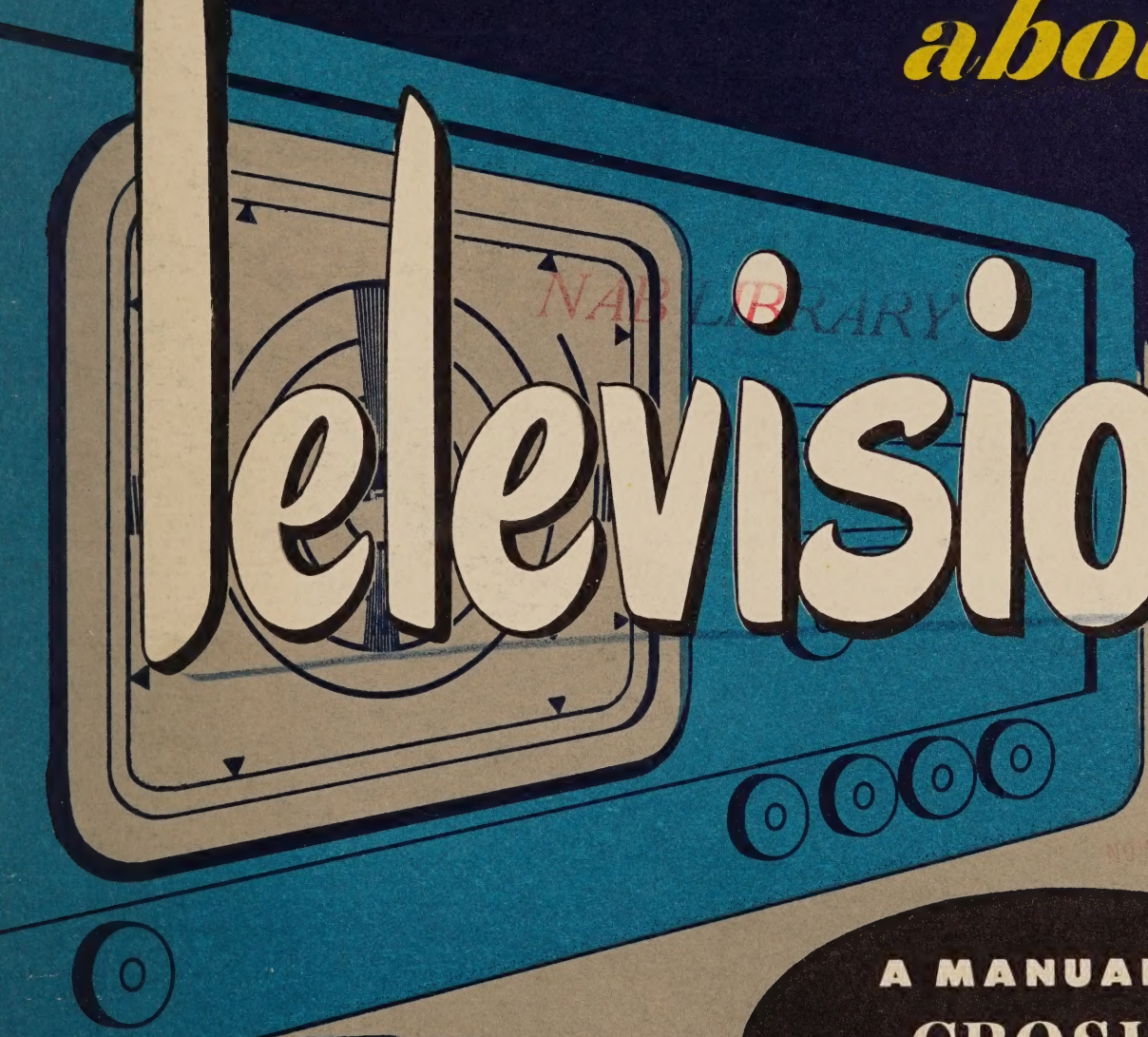
what YOU should know about

Television



A MANUAL FOR ~~CROSLEY~~ DEALERS AND SALESMEN

WHAT IT IS...HOW IT WORKS...HOW TO SELL

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To Help You

SELL TELEVISION

This is YOUR television manual.

In plain, non-technical language it gives you the facts you need to SELL Crosley television receivers.

Since television is virtually a new field the door is wide open for real salesmanship. Make the most of this opportunity.

Know what television is! Know how it works! The facts are all here in your manual. Read every page of it—study it—digest it—become familiar with all the valuable information. Then use this information to help you SELL Crosley television receivers.

Remember — your customer always respects you when you know your product!

You Can Sell Better When You Know

the facts about television

Where To Find Helpful Selling Information In This Book

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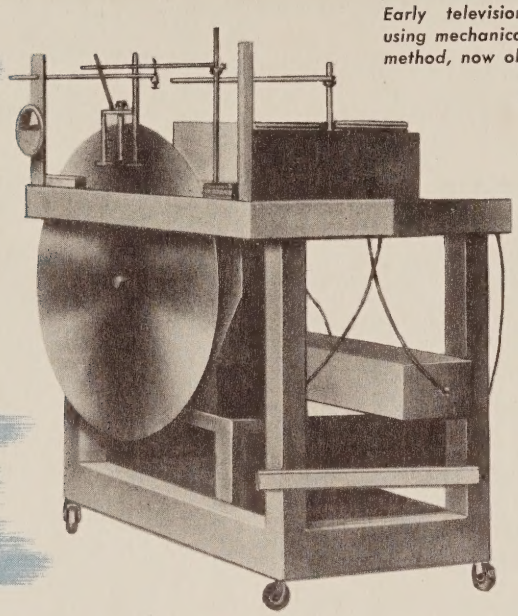
You Can Sell Better When You Know About...

the industry background



Early television scanner using mechanical scanning method, now obsolete.

"Way Back When"

Television is not a "new toy"—an experiment. It is a solid engineering achievement, fully tested and tried. Of course, in the years to come, television will be further improved, because the industry is constantly striving for perfection. But, there is no more reason for a prospect to wait for these improvements before buying than there would be for him to put off buying a car on the theory that cars of the future will be improved over present models.

The theory of television existed as far back as 1884. But no practical means of sending out picture images over the air existed until the 1920's.

Even after the means were developed it took years of experiment before field tests on electronic television could be made. The first such test was made in the early 1930's.

Experiments in many countries led to the rapid development of television. Public television service in the United States was inaugurated in New York in 1938.

Because of the war, service was on a restricted basis until the war's end.

Television as we know it today is thought of by the layman as a postwar creation, in spite of the many years of research behind it. That is because of the great expansion made by the industry since 1945. Engineering-wise, the industry was in full swing before the war, but the public was kept out of the picture until television was thoroughly ready commercially. Since the war, production has expanded into a billion dollar industry.

Television networks are a reality today.

Over a million TV sets were sold by the end of 1948. It is expected that by 1953 there will be at least sixteen million receivers in operation.

While 96% of homes today have radios, only a fraction of that number has television receivers. The field is vast and practically untapped. There is a profitable market for years to come, with unlimited sales opportunities for you. Yes, television is not an experiment. It has arrived!

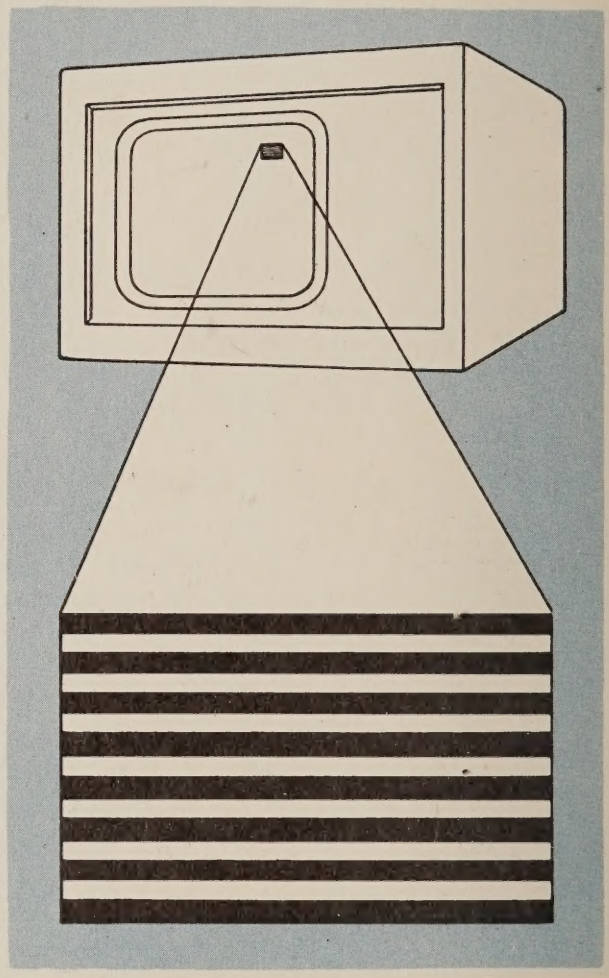
You Can Sell Better When You Know About...

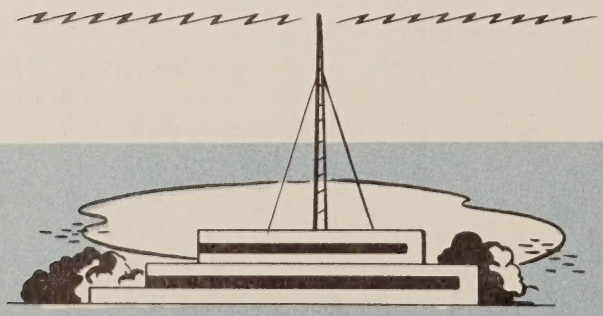
how the television picture is built up...

The picture images you see on the television screen look like complete pictures with continuous movement. But they just look that way. Your eyes are being deceived.

Actually, what you look at is a series of parallel lines of light, one above the other, similar to the lines in the illustration at the right. These lines of light aren't complete either.

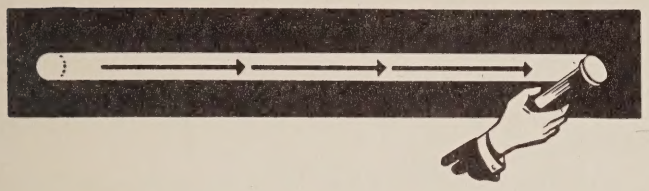
Each line is made up of a sequence of "dots" of light. These dots race at a terrific speed from left to right to form one line, then another and another from top to bottom of the picture frame we see. But these lines occur so fast that the eye is fooled into believing that it sees a complete picture.



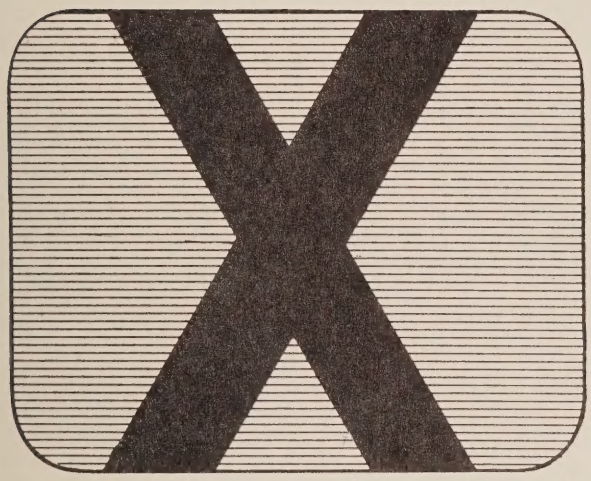


HOW THE TELEVISION PICTURE IS BUILT UP (continued)

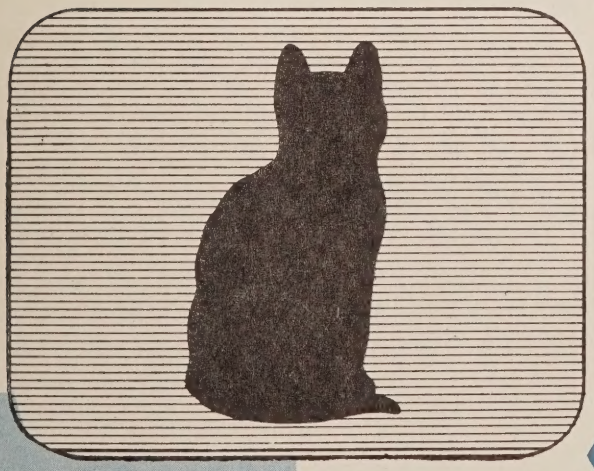
The action described on the preceding page is a process known as "scanning," by means of which the picture to be transmitted is broken up into lines, with variations in light intensity along each line, picked up by the scanning apparatus, reassembled and reproduced on the receiver. This process is described in more detail on pages 6 through 11.



Now, let's get back to our "dot" of light. If a blinking flashlight were whisked from left to right, it would appear to the eye as a continuous line of light.

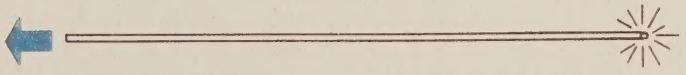


By repeating this whisking of the flashlight in a series of parallel lines, and turning the flashlight off and on at certain intervals, any desired pattern can be formed by the resulting combination of light and shadow—a simple pattern such as the one at the left or . . .



A complete picture such as the cat at the left. Of course, this would have to be done very, very precisely and very, very fast, to create the illusion of a complete picture. In television the action *is* very, very accurate and very, very fast—525 lines to a complete picture, or frame, and 30 of these frames per second. This rapid parade of lines and frames, faster than the eye can follow, is what creates the illusion of a complete picture in continuous motion. You might wonder, now, what keeps these lines of light running from left to right and top to bottom of each frame as they do. It's quite simple . . .

A signal at the end of each line says to the apparatus "START NEXT LINE."



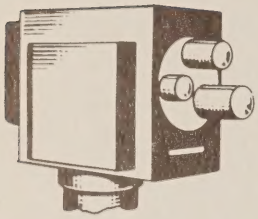
A signal of longer duration at the end of the last line says "START NEXT FRAME."

You Can Sell Better When You Know About...

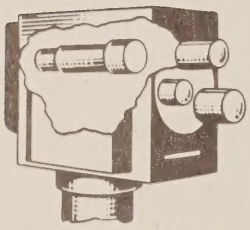
television processes

the camera
the transmitter
the receiver

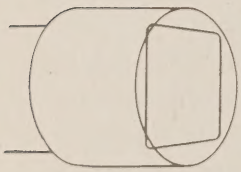
THE CAMERA



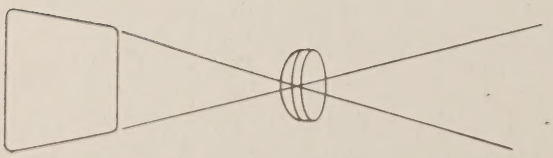
1. This is a television camera. It is called a camera because it looks much like a movie camera.



2. Inside is a picture or camera tube, the principle part of the camera.

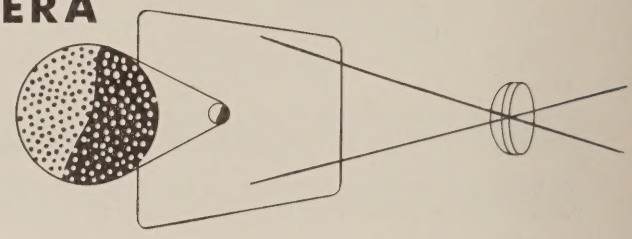


3. In front of this tube is a mica plate, called the mosaic.

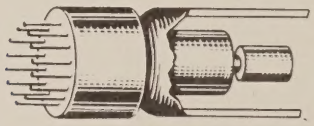


4. The camera lens system focuses the scene to be televised, onto the mosaic.

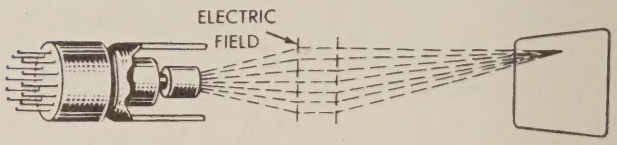
When ordinary light strikes the particles on the plate it tears away electrons. The more light the more electrons are detached. These detached electrons (negative electricity) are carried out of the tube, leaving a field of positive electricity on the mosaic, corresponding in intensity at each point in proportion to the amount of light that struck each minute area.



5. This plate is covered by millions of granular structures, each insulated from each other. Each granule is like a photo electric cell. It has the property of turning light which falls on it into an electrical charge.



6. In the other end of the camera tube is an electron "gun."



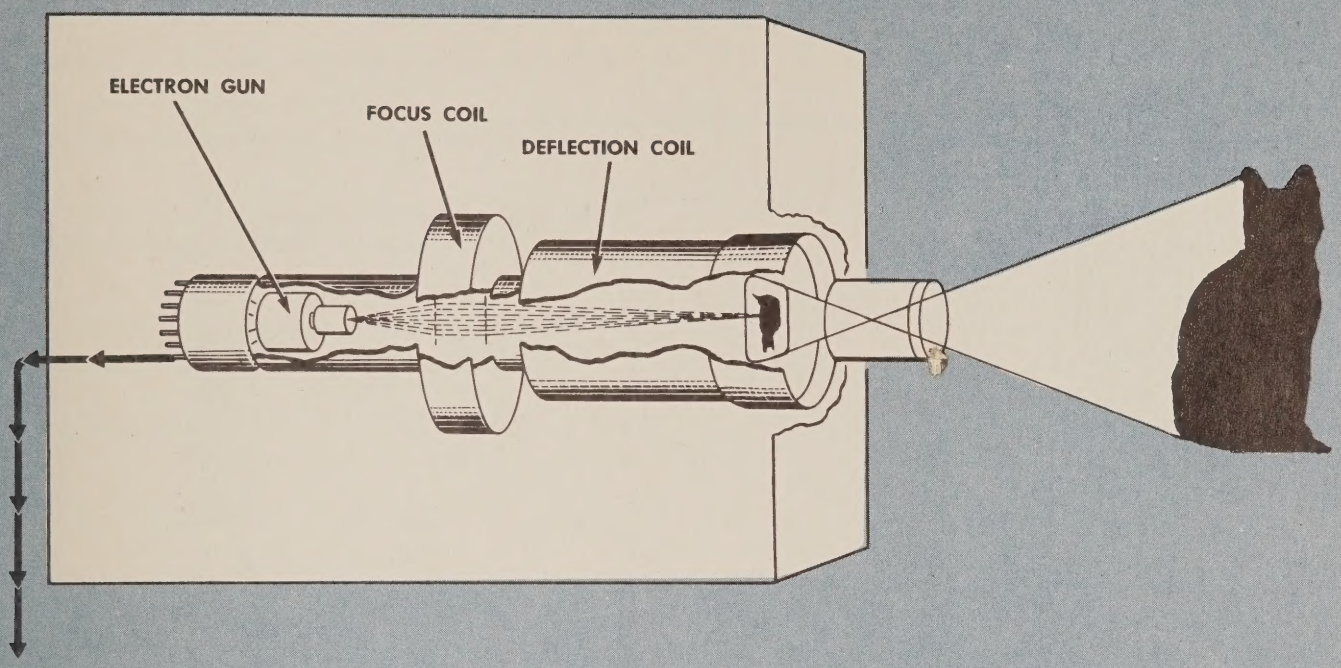
7. This gun fires a beam of electrons onto the cells of the mosaic. The gun is controlled by circuits within the camera. The beam is focused into a pinpoint by means of focusing coils or plates.

8. This beam is guided across the mosaic, from side to side, row by row, and from top to bottom of the picture as we see it, by horizontal and vertical deflection plates or coils.

As the beam is passed over the mosaic, the various charges on the mosaic affect the beam in such a way that a signal corresponding to the original picture is created.

This signal, made up of electrical impulses, is picked up, amplified and is drawn out of the camera tube as a television signal.

NOW, LET'S PUT ALL THESE ELEMENTS TOGETHER AND SEE WHAT GOES ON IN THE CAMERA WHEN A SCENE IS TELEVISED.



Suppose we are going to televise a black cat sitting in a snowdrift. Where a movie camera would record the scene on film, the television camera changes this scene from a pattern of lights and shadows into a fluctuating electrical current.

The lens system focuses our black cat scene onto the mosaic in the front end of the camera tube.

Light from the snowdrift, since it is intense, tears away a lot of electrons from the mosaic cells. Light from the black cat, which is very scant, tears away very few electrons from the cells.

This leaves, as you learned on the previous page, a field of positive electricity on the mosaic, varying in intensity in proportion to the amount of light, from the snowdrift and the cat, which struck each minute area.

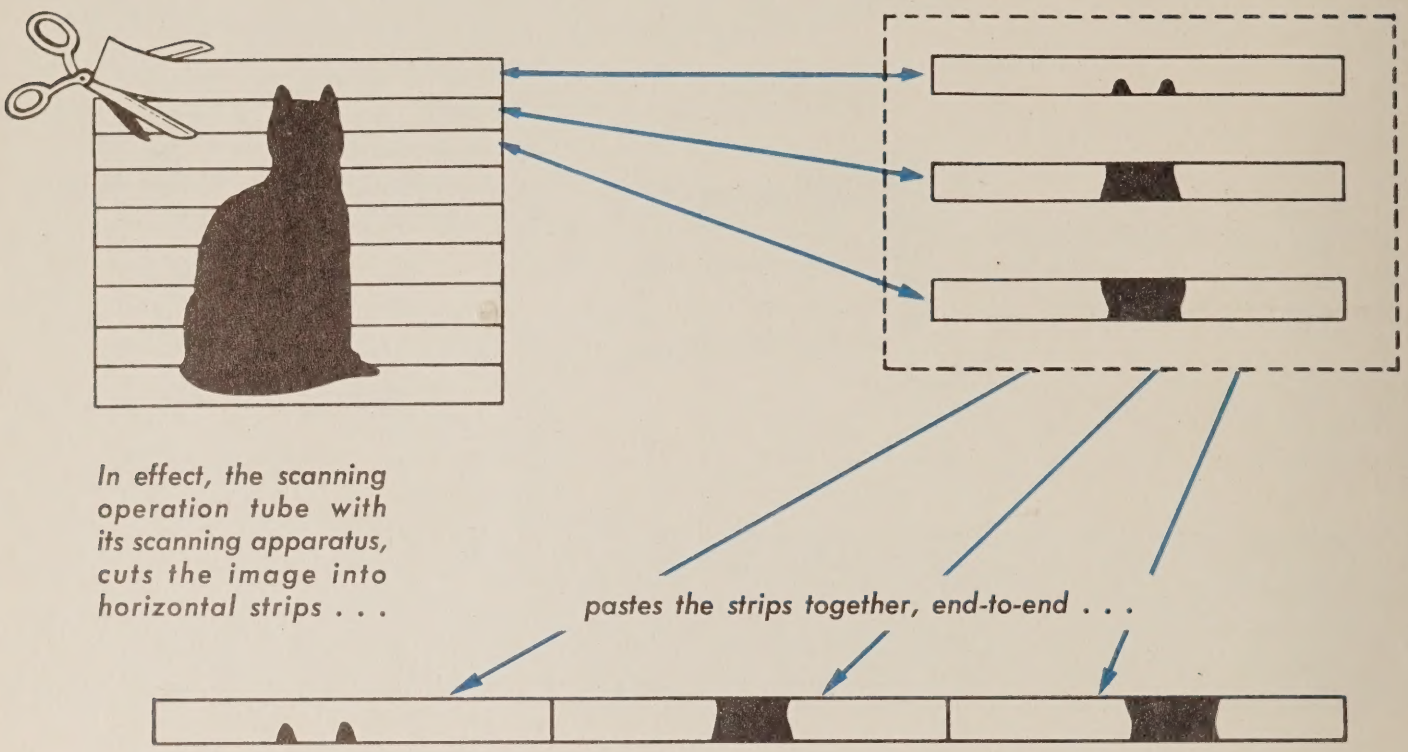
Now, the electron gun at the base of the camera sweeps a pinpoint beam of electrons across the mosaic—from left to right and from top to bottom of the frame. (We'll talk more about this process of scanning on the next page.)

When this beam hits the strong positive areas caused by light from the white snowdrift, a lot of electrons from the gun stick to the cells. When the beam hits the weaker positive areas, caused by light from the black cat, fewer electrons stick to the cells, thereby causing the value of the television signal to vary as the lights and shadows of the picture vary.

As the beam of electrons strikes each light-sensitive granule on the mosaic, it replaces the electrons torn off, thereby removing the picture, making it ready for the next one. Thus an electrical impulse, its strength depending on the amount of light that struck it, is created and picked up by the signal plate in back of the mosaic. This is the picture part of the television signal that goes out over the transmitter.

A series of these changing signals matches point by point the scene focused on the mosaic.

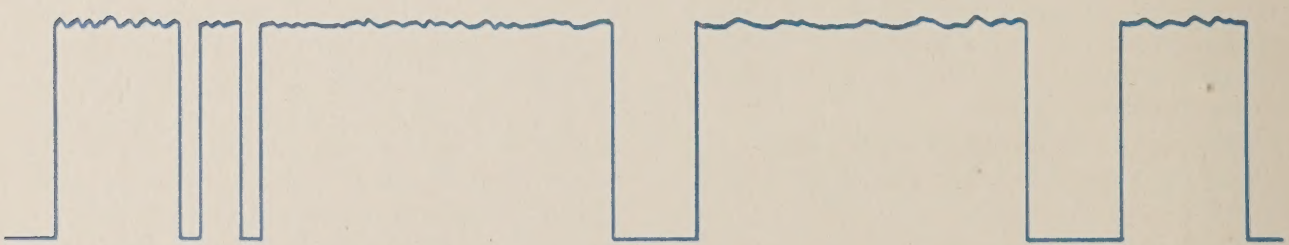
SCANNING



In effect, the scanning operation tube with its scanning apparatus, cuts the image into horizontal strips . . .

pastes the strips together, end-to-end . . .

. . . and converts the light values in the strips into electrical values of corresponding magnitude.



In the scanning operation the picture is cut into many thin horizontal strips—525 to be exact. And the operation of dissecting each picture occurs in 1/30 second. Actually, each picture is scanned twice in that time—every other line on the first strip from top to bottom, and the intervening lines on the second strip. This minimizes flicker.

Along each of these strips there occur many variations of light intensity. (In the case of our cat and the snowdrift, the black areas are converted into weak signals and the snowdrift into strong ones.)

As the picture is dissected, the strips are joined end to end, giving us one long strip with varying shades of light and dark. The light values which make up a strip are then converted into current values. The bright light values will become strong current values and the shadowy light values will become weaker current values.

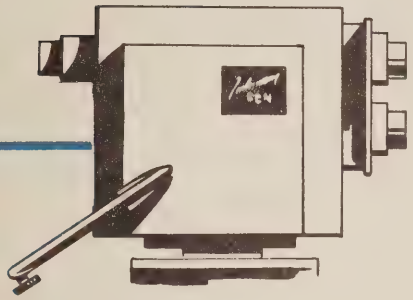
Now we have a series of fluctuating electrical impulses which can be used to control the picture signals as sent out over the air.

As the electron beam scans the picture, a stronger signal is generated as part of the picture signal at the end of each horizontal line. A still stronger signal, also part of the picture signal, is generated at the end of the last line.

These strong signals at the end of each line and at the end of each picture are used to control the electrical impulses so that the receiver can rebuild these impulses into a picture. These signals are known as "sync" (synchronizing) signals.

THE TRANSMITTER

The TELEVISION PICTURE



After being amplified in the camera, the picture signal is fed through a transmission line to the transmitter, complete with information (sync signals) on how the picture is to be reassembled.

The transmitter generates a carrier wave. This is a radio wave of a certain established frequency and is identified by the channel number assigned by the Federal Communications Commission to that station.

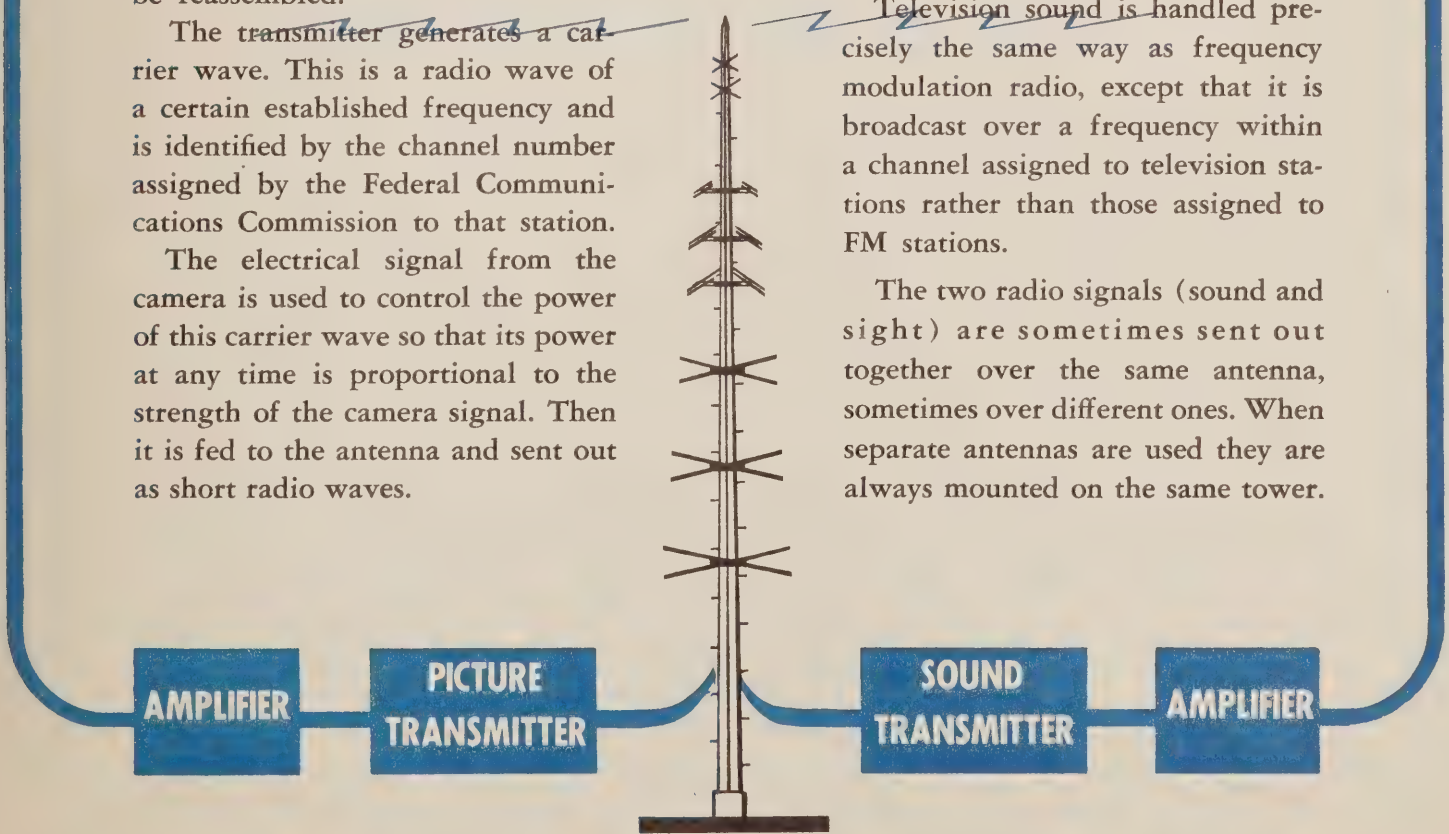
The electrical signal from the camera is used to control the power of this carrier wave so that its power at any time is proportional to the strength of the camera signal. Then it is fed to the antenna and sent out as short radio waves.

TELEVISION SOUND

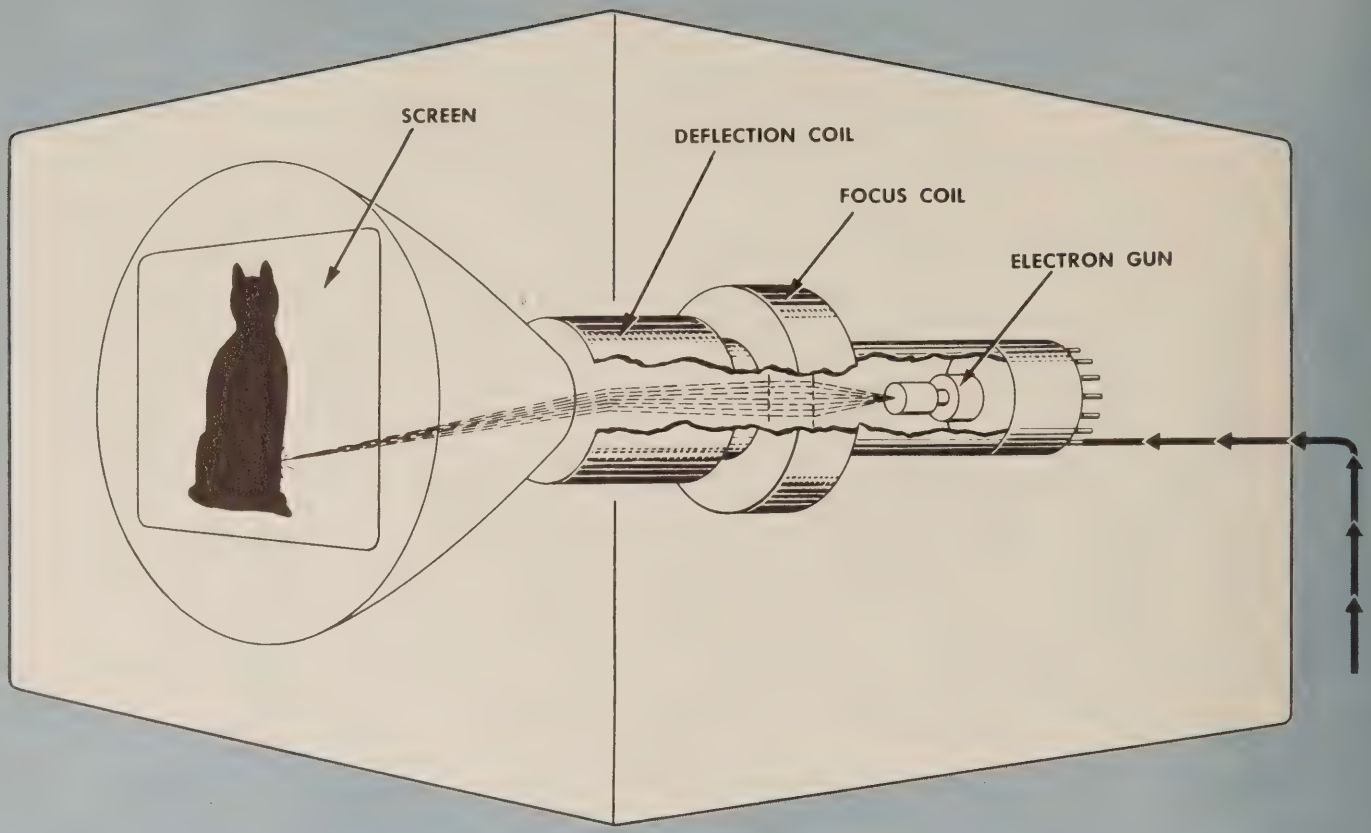
The sound for the television program is picked up by microphones simultaneously with the televising of the scene. The sound is broadcast from its own transmitter.

Television sound is handled precisely the same way as frequency modulation radio, except that it is broadcast over a frequency within a channel assigned to television stations rather than those assigned to FM stations.

The two radio signals (sound and sight) are sometimes sent out together over the same antenna, sometimes over different ones. When separate antennas are used they are always mounted on the same tower.



ANTENNA FOR SIGHT AND SOUND



THE RECEIVER

Here's the cat again — exactly as we saw it being picked up by the television camera. But now, the transmitting process is reversed. The electrical impulses, or television signals, that went out over the air, are now changed back into impulses of light, the picture image that is viewed at the end of the receiver tube.

Here's how it's done →

The signals from the transmitter are picked up by the antenna of the receiver. These signals are carried to the receiver by means of a special transmission line. But the signals are too weak to be used as is, and must be amplified thousands of times in the receiver.

Then the signals are separated into →

- Signals which control light values.
- Signals that give instructions on how the picture is to be reassembled line by line and frame by frame on the receiver (sync signals).
- Sound signals which are converted into audible sound in the same manner as in FM radio.

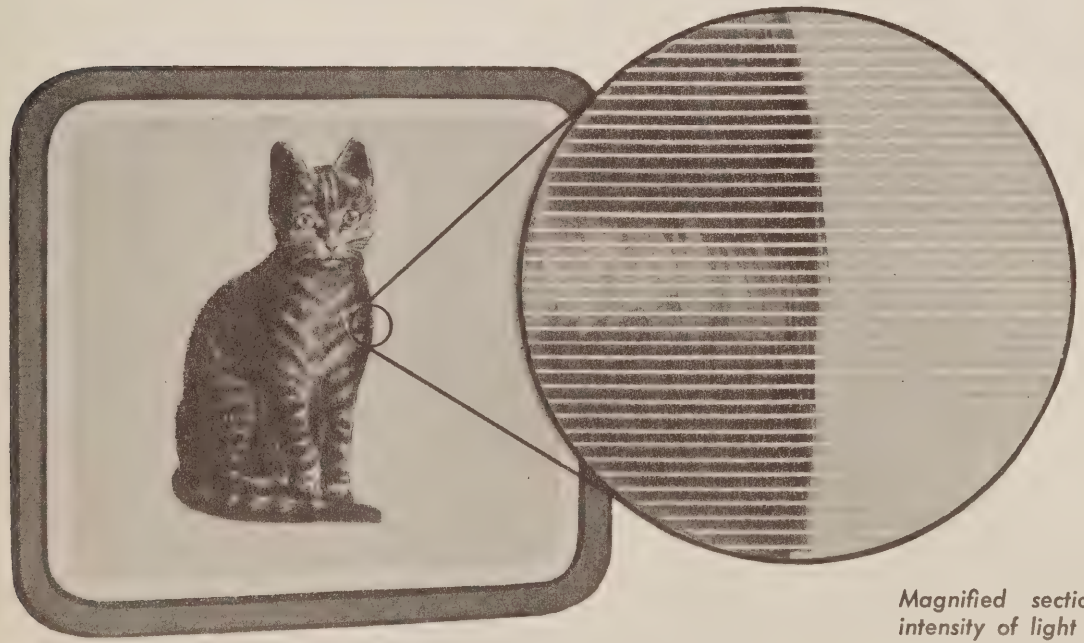
The receiver has a vacuum tube called the cathode ray tube or, simply, picture tube. The picture tube, like the camera tube, is provided with an electron gun. This gun emits a beam of electrons which is focused on the enlarged or picture end of the tube. This end of the tube is covered with a fluorescent material which glows like a fluorescent light when hit by the electrons in the beam.

The beam from the electron gun, guided by the synchronizing signals sent from the camera, is deflected against this "screen" in exactly the same way the beam from the electron gun in the camera scans the "mosaic."

The electron beam scans the fluorescent screen and the stream of electrons is in direct proportion to the strength of the signal. Thus, since the strength of the signal was determined by the intensity of the light in the original image, the number of electrons fired out of the gun at any spot on the fluorescent screen corresponds to the brightness of the same spot on the original image.

Since any spot on the screen lights up in proportion to the number of electrons with which it is bombarded, the brightness of each spot on the screen from black through grays to white is relatively the same as the brightness of the same spot on the original image.

Thus, as the electron beam sweeps over the screen, scanning it just as the beam in the camera scanned the original image, a duplicate of that image is created on the screen.



Magnified section shows how the intensity of light along each scanning line varies from black through gray to white exactly as in the original image.

You Can Sell Better When You Know About...

television transmission

- Television Channels
- FCC Requirements
- Short Wave Characteristics
- Signal Strength
- Fringe Areas
- Networks

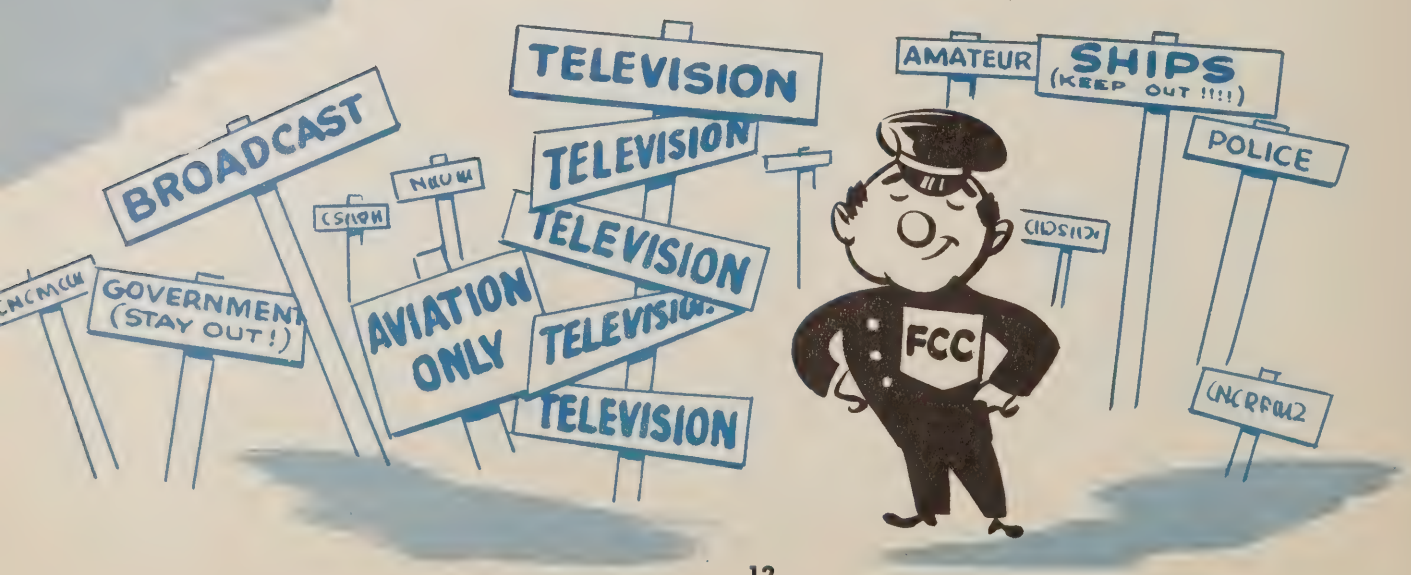
The airways are crowded with radio signals.

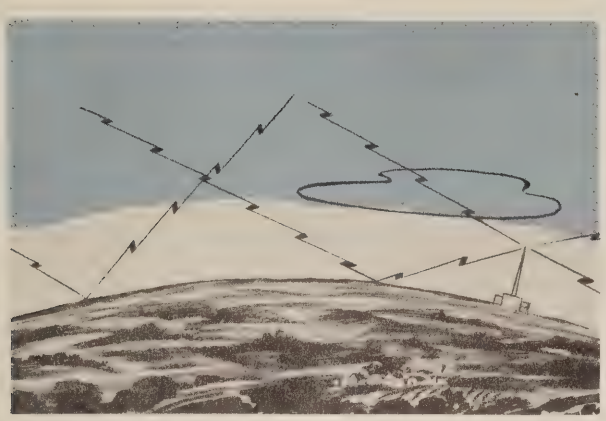
To control this traffic, the Federal Communications Commission operates as a "policeman."

To keep each signal from interfering with the others, the FCC assigns to each transmitting station a "traffic route," or frequencies, upon which it may broadcast.

For commercial television transmission FCC has assigned 12 frequency "channels" numbered 2 through 13. Channels 2 through 6 are in the low band between 54 and 88 megacycles. Channels 7 through 13 are in the high band between 174 and 216 megacycles.

Each channel is six million cycles wide and can accommodate many stations, provided that they are far enough apart so that they do not interfere with one another, in accordance with FCC regulations.





The television range is limited because . . .

. . . unlike long-wave radio waves which follow the curvature of the earth and also bounce back and forth between the earth and the ionosphere and can therefore be picked up at great distances . . .

. . . the ultra-short television waves travel in a straight line like light waves. Since they do not follow the curvature of the earth or bounce off the ionosphere and return to earth, they have maximum efficiency only to the horizon, traveling off into space at that point.

Because they travel in a straight line, television waves are sometimes affected by barriers such as hills and tall buildings. As a result, under certain conditions, such barriers sometimes cause dead spots within a service area.

To get the maximum possible range, television is transmitted from the tops of tall buildings, or from towers as tall as possible to push the horizon back.

Increasing the power of the transmitter will not greatly extend the range of the television signal. But it will increase the strength of the signal over the same range, making possible generally better reception throughout the area.

For example . . .

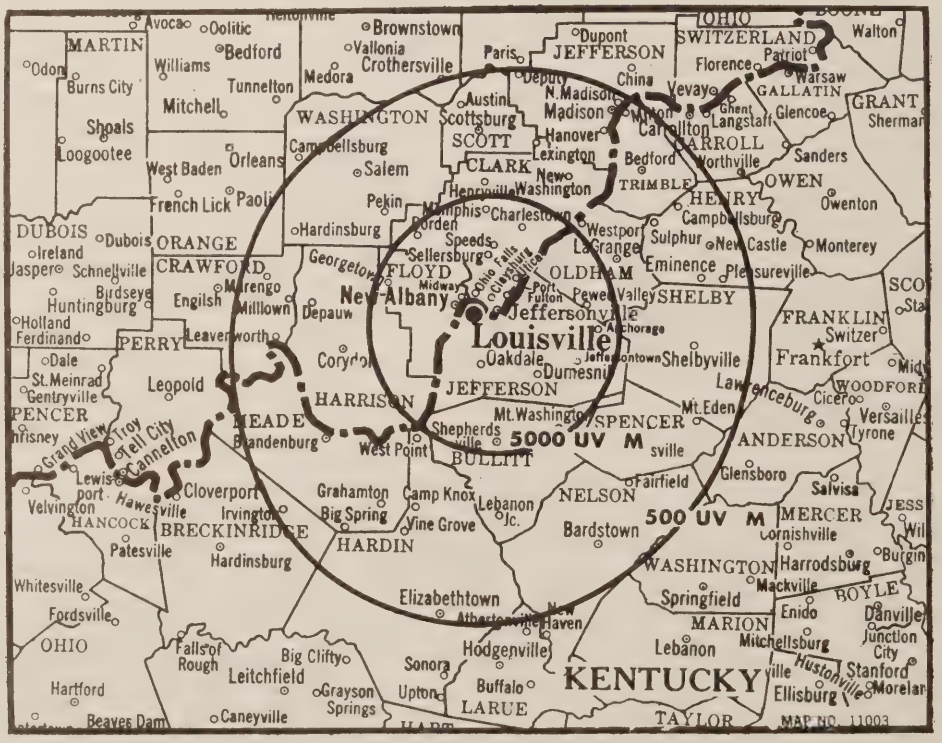
Imagine a pond with irregular borders, deep in the center and shallow around the edges. If you throw a small stone into the center of this pond it will cause waves which radiate well in the deep water but attenuate, or fade out, as they reach the shallow water. Now, if you throw in a large stone, bigger waves will radiate out from the center of the pond. These waves will travel well in the deep water, but will also fade out rapidly as they reach the shallows. Fringe areas are like the irregular shallow areas in the pond, where waves are weak and irregular.

A field signal strength map, such as the one shown below, can be obtained from your local television station. This map shows the limits of the regular broadcast area—the area in which you can expect good reception.

Sometimes signals may be received outside of the regular transmission range. Areas in which such reception is possible are referred to as fringe areas.

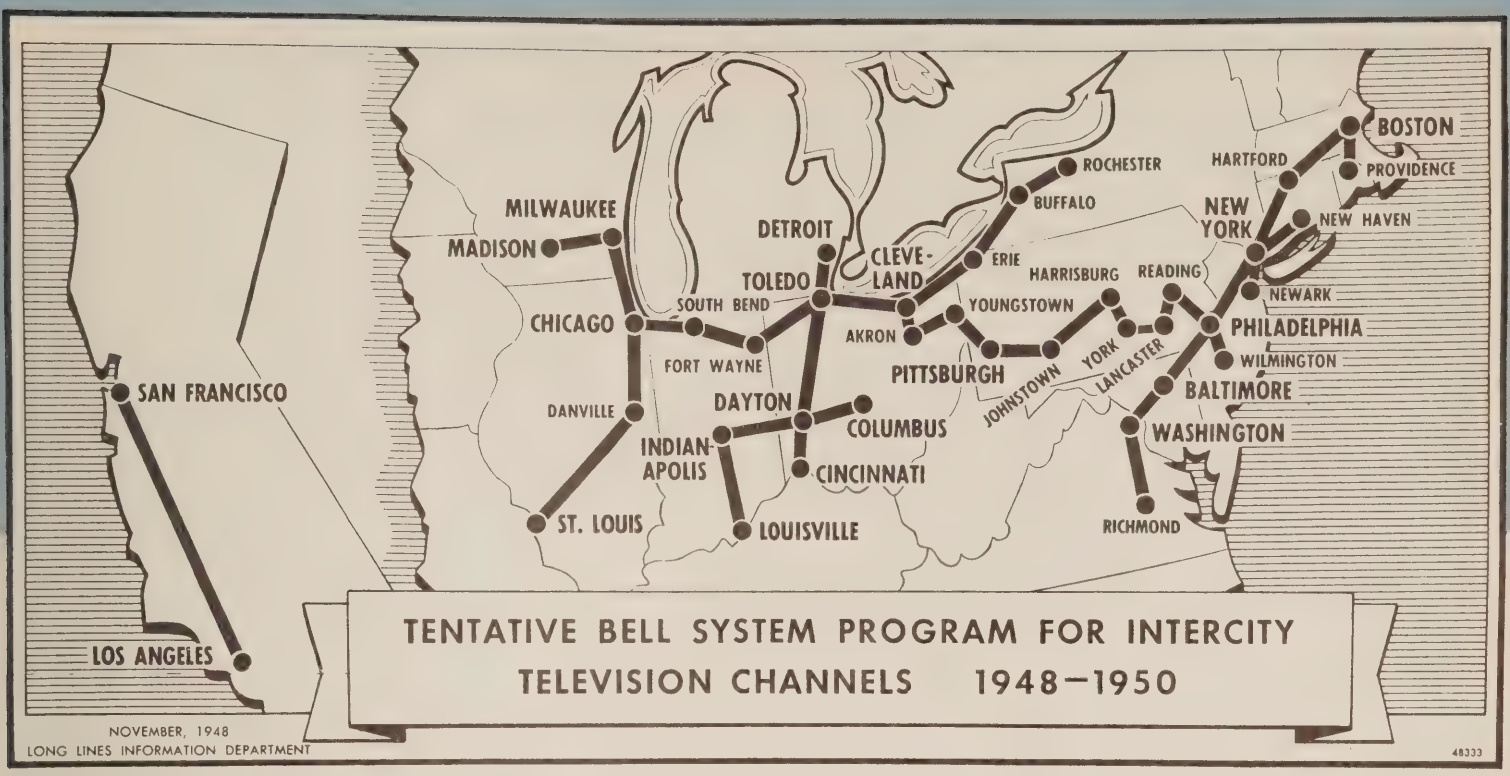
It is difficult to predict the quality of reception in a fringe area without installing a set and trying it out. Sometimes special antenna installations are required for satisfactory reception in these areas. Such installations are apt to be costly. If such problems arise, ask the Crosley Service Department for further information.

STATION WAVE - TV - LOUISVILLE, KY.
CHANNEL 5 24.1 KW. 510 FT.



CONTOUR	AREA	POPULATION
5000 UV/M*	960 Sq. Mi.	454,462
500 UV/M*	3,720 Sq. Mi.	142,359
NET SERVICE	4,680 Sq. Mi.	596,821

Microvolts per meter



A T & T

NETWORKS

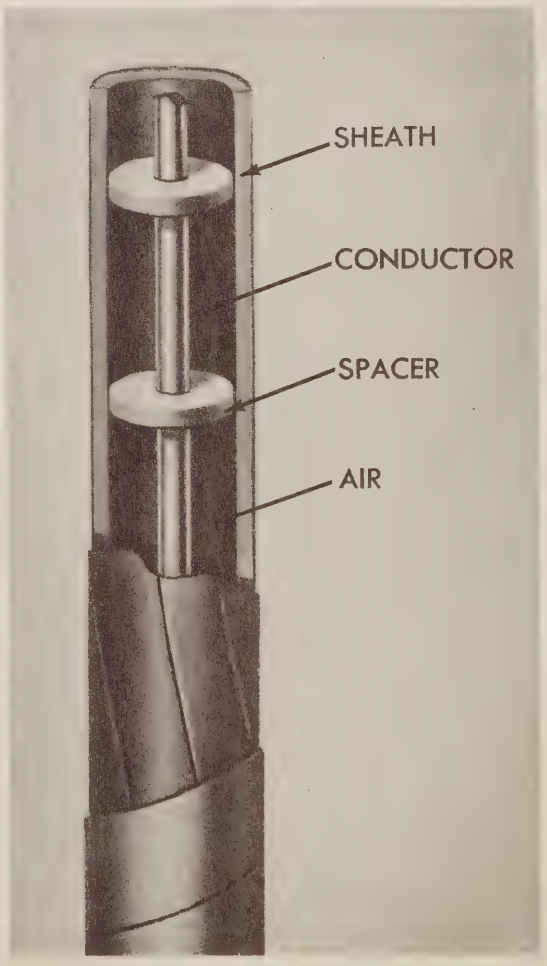
Television networks cannot be set up as simply as AM radio networks. For instance telephone wires, used to carry AM broadcasts, are not adequate for transmitting television signals, because the transmission of the high frequencies these signals require is not possible over ordinary telephone lines.

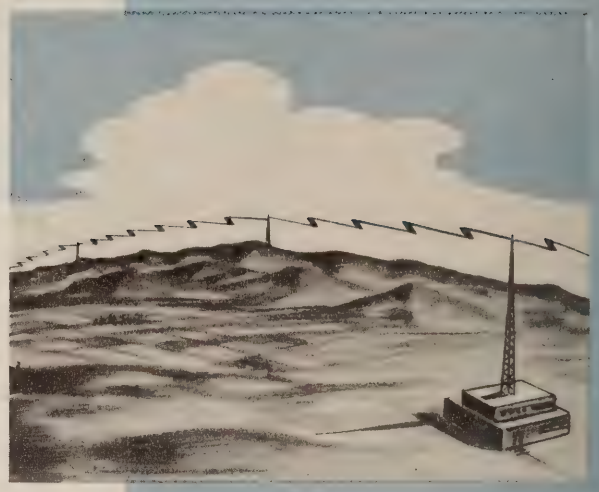
This, plus the limitations of line-of-sight transmission, is being overcome to make television networks a reality.

Coaxial Cable

Special coaxial cables have been developed. These cables consist of an inner core, insulated from an outer shield. This type of cable is capable of carrying television signals. The efficiency of a coaxial cable is best illustrated by the fact it can carry as many as 1000 telephone conversations at the same time. When this cable is used for television, it can carry only one television transmission.

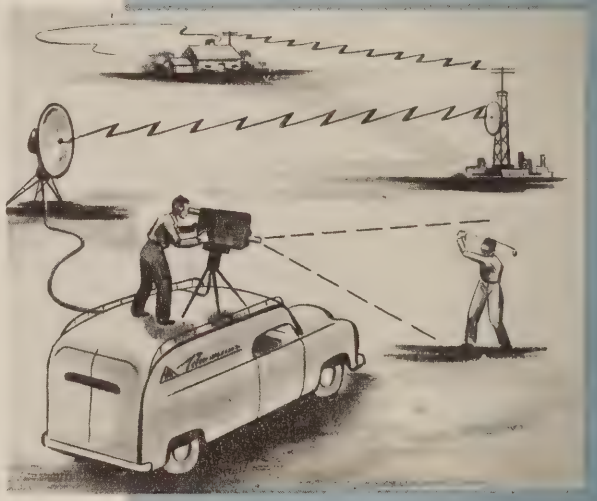
American Telephone and Telegraph is laying a network of coaxial cables for the transmission of television programs as shown above. These cables will be rented by the networks and television stations.





Relay stations, consisting of receivers, amplifiers, and transmitters, are another means of handling network television programs. High towers, within line of sight distance, approximately 30 to 40 miles, pick up the signals, boost their strength, then pass them along. Signals of ultra-high frequencies are used and narrow beams from tiny antennas in parabolic mirrors are accurately aimed from one station to the other.

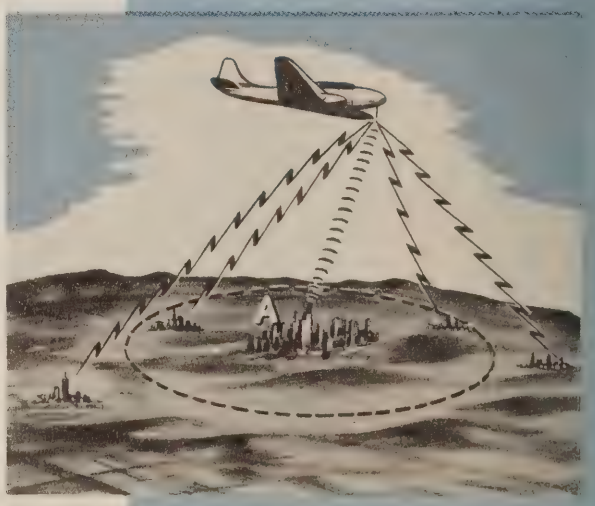
Remote Pickup



For remote pickup of "on the spot" televising, much the same system as described above is used.

A sound truck at the scene being televised transmits a highly directional ultra-high frequency signal to the station, using a tiny antenna and parabolic mirror as described above. The station picks up the signal, amplifies it, and transmits it to the receivers in the area.

Stratovision



A specially designed and equipped plane, circling at 30,000 feet, picks up the signals transmitted on special wave length for this purpose, from a transmitter (A) below. The transmitter in the plane then retransmits the program in its regularly assigned television channel. This type of operation can increase the range of a transmitter by hundreds of miles.

You Can Sell Better When You Know About...

Effect of Interference and Improper Installations on

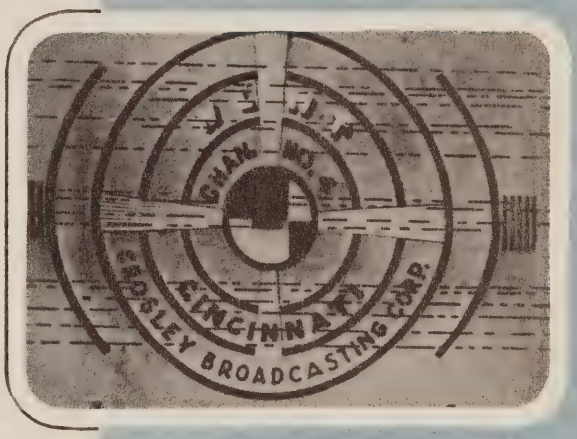
television reception

Television, like FM radio, is transmitted on very high frequencies. Because of the characteristics of radio waves, these very short television waves and FM waves are usually not subject to interference caused by atmospherics which plague reception of regular programs broadcast on lower frequencies.

Man-Made Interference

There are some types of man-made interference which affect television reception.

While such interference is *heard* on a radio receiver, it is *seen* on the television screen as a pattern which interferes with the picture. Each type of interference is identified by its own characteristic pattern. Described below are the common types of this man-made interference.



■ Auto Ignition, Etc.

Interference caused by automobile ignition (the worst offender), flashing neon signs, or electrical machinery such as fans, elevator motors, street cars, etc., may cause a pattern such as in the picture at the right.

You Can Tell It by . . . Black Dots or Speckles . . . If Very Severe, Picture Stability May Be Affected.

■ Diathermy

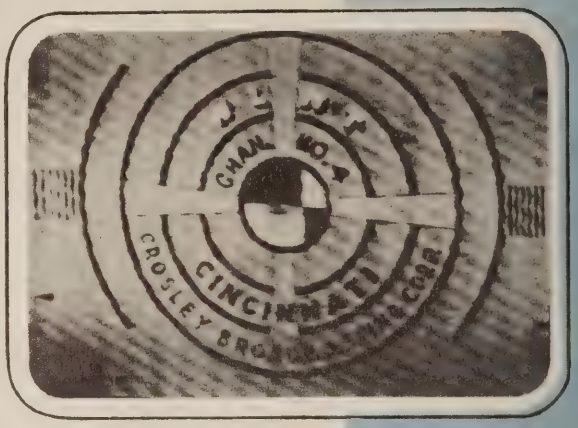
If strong diathermy apparatus is the culprit, an irregular pattern through the center of the picture may result, such as in the picture at the right.

MAN-MADE INTERFERENCE

Short-Wave Radio Equipment

Transmitting and receiving short-wave radio equipment, such as commercial police or amateur apparatus may cause an interference pattern such as shown in picture at right. Such signals may cause interference several miles away from the offending equipment. Nearby FM or television sets may cause a similar interference.

You Can Tell It By—Moving Ripples



IMPROPER INSTALLATIONS

"Ghosts" Reflections

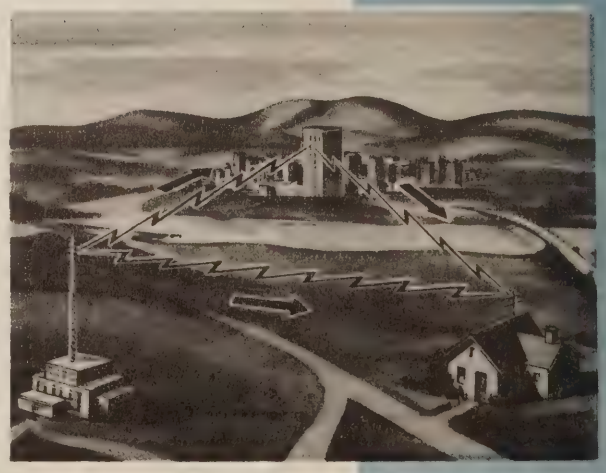
Improper installation may cause "ghosts," or multiple images on the television screen.

Ghosts show up as shown in the picture on the right.

Ghosts are caused when the receiver antenna picks up the signal from the transmitter in the normal way and then picks up the same signal after it has reflected from a building, metal structure, mass of masonry, hill, or mountain.

The quickest route the signal can travel is in a straight line—from the transmitter to the receiver antenna. The signal that bounces off of an object to the antenna takes longer and shows up on the screen as a late arrival. An antenna shield will absorb such reflections and prevent multiple images.

Under certain conditions, indoor antennas will create "ghosts." Many times when indoor antennas are responsible for this condition, installation of a suitable outdoor antenna may produce good results.



WEAK PICTURES

Weak pictures generally show up in fringe areas.

On the screen they have a speckled "snow" effect such as shown in the picture above.

Weak signals may be caused by an antenna that is not picking up the signals properly. This condition may be remedied by getting better orientation, installation of a higher, multiple-layer antenna or a Crosley Teleflex Folded Dipole with Reflector.

Weak signals caused by insufficient gain can sometimes be strengthened by the addition of a booster. However . . .

Crosley does not design its receivers for any type of boosters and consequently can not guarantee performance of Crosley receivers to which boosters have been added.

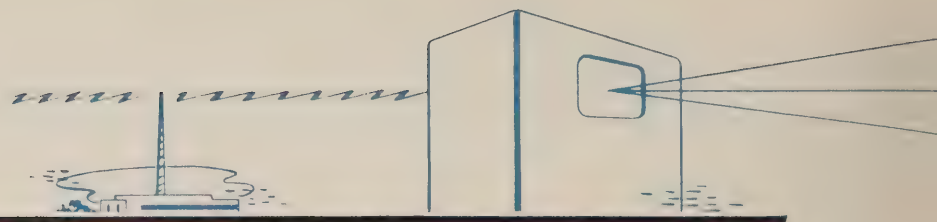
Excessive interference results when an unshielded antenna lead is placed too close to an electric refrigerator, vacuum cleaner, electric razor, or other "interference makers." A shielded antenna should be installed to avoid interference from such sources.

Interference difficulties are more severe in fringe areas.

Weak signals may also be the result of indoor antennas. If an indoor antenna is the cause of weak signals, installation of an outdoor antenna will sometimes permit good reception.

In an area served by two or more stations, one may be received satisfactorily and the others not, because of the orientation of the antenna.

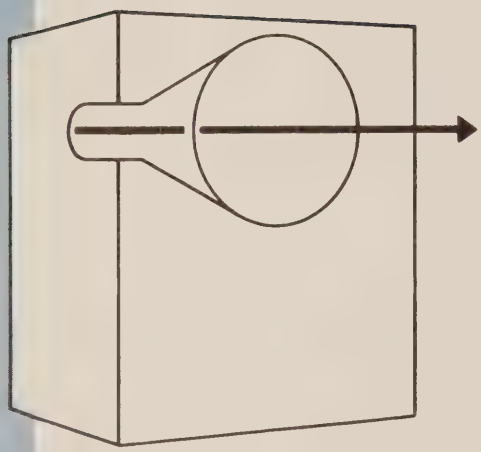
You Can Sell Better When You Know About...



television receivers

VIEWING SYSTEMS

Direct View

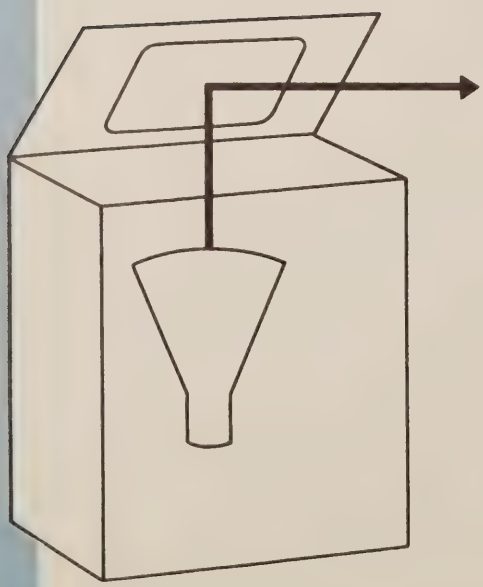


In this system pictures are viewed directly on the end of the picture tube.

Direct view receivers are sometimes identified by the size of their picture tubes, much as cars are designated by the number of their cylinders. Tube sizes in general use today are: 7-inch, 10-inch, 12-inch, 15-inch, 16-inch, and 20-inch.

While most tubes in use today are made completely of glass, tubes in which the glass envelope, or cone, is replaced by metal have been developed. These tubes are known as metal tubes, although, of course, the tube face is made of glass.

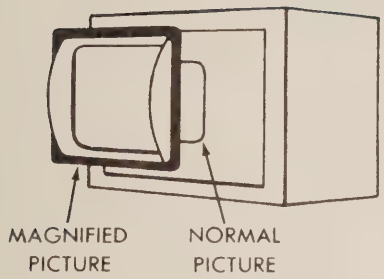
Indirect View



The picture from the tube end is reflected and seen by the viewer by means of a mirror set at an angle to the end of the picture tube.

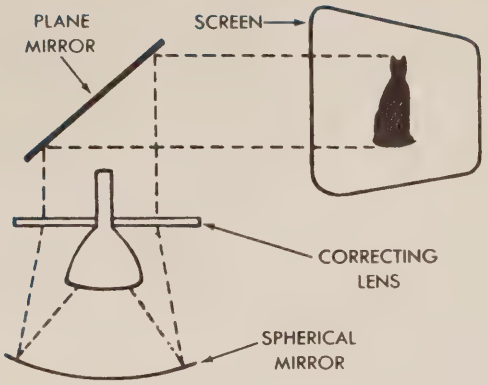
This system is limited to the same tube sizes as the direct view system. Image size depends on the tube size.

Advantages and Disadvantages of These Systems Are Listed on Page 22



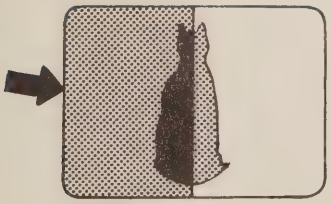
Magnifying Lenses

Magnifying lenses used in this system are large plastic or glass lenses, often filled with a colorless liquid such as mineral oil. Placed in front of the picture tube, such a lens magnifies the picture image.



Projection

A small picture tube is used, operated at very high voltages. These higher voltages provide a very brilliant image on the end of the tube. The brilliant image appearing on the end of the tube is necessary because the picture is projected through a system of mirrors and lenses, onto a scren. Some light is lost through the process. With such a system it is possible to project an image up to the size of a commercial motion picture screen as used in theaters.



Filters

All sets can be equipped with filters which serve to minimize the harmful effects of reflected lighting at the expense of some picture brightness.

Odd-Shape Pictures

Some receivers show *odd shape pictures,* such as a circle, rather than the standard rectangle with rounded corners, or circular ends, used by most manufacturers at the present time.

Advantages and Disadvantages of These Systems Are Listed on Page 23

TELEVISION RECEIVERS (Continued)

All television receiver systems are based on the public's demand for *brighter* images and *larger* images. Most systems must compromise on one of these aims in order to achieve superiority in the other, as indicated in the following comparisons.

DIRECT VIEW

Advantages

Brightest picture.

No light lost. You look at every bit of it.

Picture can be viewed under normal room conditions.

Maximum contrast. (Greatest difference between light areas and dark areas.)

Sharper images — better defined pictures.

Can be built at lower cost — requires only small cabinet.

Disadvantages

Size Limitation

INDIRECT VIEW

Advantages

Same as Direct View, but to lesser extent because a little light is lost.

Reduction in cabinet depth due to vertical installation of tube.

Disadvantages

Requires lid at top of cabinet. Nuisance if objects placed on it.

Reduces viewing angle.

Mirror is added expense.

Slightly more complicated construction.

Advantages		Disadvantages
	PROJECTION	
Larger picture than can be produced any other way.		Some loss of light and contrast. Some loss of detail. Due to design, it is somewhat more expensive. Directional screen is advantageous in order to get sufficient brightness, and therefore the viewing angle is limited.
	LENSES	
Larger picture with little loss of light.		Distortion of image possible. Lens very susceptible to reflections. Highly restricted angle of viewing. Lens must be used as a separate part to avoid large cabinet. Danger of leakage, when using oil filled lenses.
	FILTERS	
Contrast improved under certain lighting conditions. May reduce reflections.		Added cost. Light output cut down considerably. (3 to 1.)
	ODD-SHAPE PICTURES	
Round picture utilizes a larger viewing area in square inches than a rectangular picture on the same tube size because the whole end of picture tube is used for picture. The part of the picture that is seen, is amplified.		All transmitters send out rectangular picture in 4 x 3 proportion as established by FCC. When a circular picture is superimposed on this rectangular picture, 41% of the picture is lost. This loss can be minimized by distorting the horizontal dimension of the picture so that the width does not exceed the height. In this way, while only 21% of the picture is lost, the picture is not a true reproduction of the transmitted image.

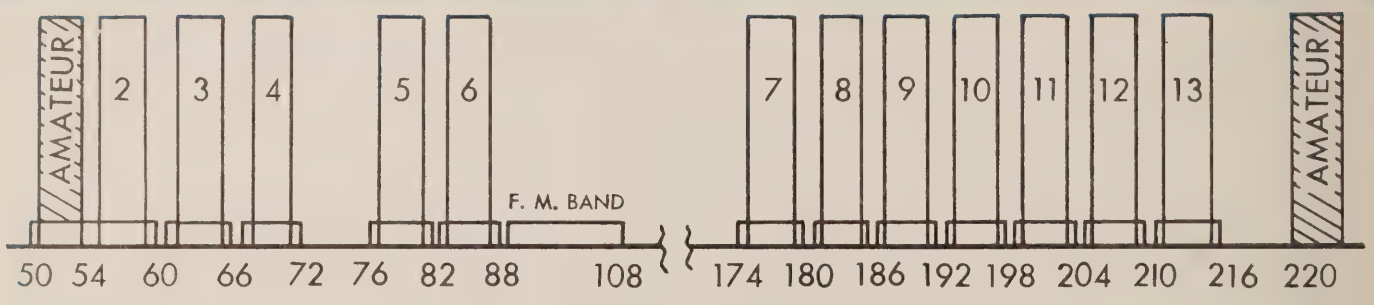
TUNING SYSTEMS

Two types of tuning systems are used in television receivers.

1. THE CONTINUOUS TUNER

- Covers the 12 Television Channels, or . . .
- Covers the Television Channels—plus all FM bands in between including the commercial FM broadcasting bands.

TUNES ALL 12 CHANNELS



TELEVISION CHANNELS AND FREQUENCY ALLOCATIONS

2. PRE-ADJUSTED CHANNEL TUNER

- May or may not have a vernier (fine tuning) adjustment.
- Is pre-tuned to all 12 channels, or . . .
- Is pre-tuned to a selected number of channels. Service adjustment is necessary to tune such a set to other channels.

You Can Sell Better When You Know About...

use of controls and adjustments

- Service-Adjusted Controls
- Owner-Adjusted Controls
- Use of Controls for Good Pictures

Most television receivers have the following controls—some for service adjustment—others for manual control by the owner. In some sets some owner-operated controls may be found on the *back* of the set.

CONTROLS USUALLY SERVICE-ADJUSTED

- Focus
- Vertical Hold
- Horizontal Hold
- Centering Controls
- Picture Height
- Picture Width
- Vertical Linearity
- Horizontal Linearity

CONTROLS USUALLY OWNER-OPERATED

- Tuning Control
- Power Switch
  (Usually combined with sound volume control)
- Volume Control
- Tone Control
- Brightness Control
- Contrast Control

The above controls are used to produce a picture which is clear and steady, and has the proper degree of brightness and contrast.

Service-Adjusted Controls

Focus Control

This control regulates the sharpness of the picture. If improperly regulated, the picture will be fuzzy or indistinct.

An improperly focused picture can be brought into proper focus by turning the focus control clockwise or counter-clockwise, meanwhile observing the individual horizontal lines in the picture. When the control is adjusted so that these lines are at their minimum width, the picture will be in focus.

Vertical Hold

This control when properly adjusted holds a picture stationary on the screen. When improperly adjusted, a rapid series of pictures move up or down across the screen, much like a movie film which has stripped sprocket guides.

To correct, first make the picture weak. Then rotate vertical hold control clockwise or counter-clockwise until a single picture is stationary on the screen. Then set the control in the center of the range in which it makes the picture stationary.

Horizontal Hold

This control regulates the starting time of all lines. When improperly adjusted, it will show a "torn" picture.

To correct, adjust the horizontal hold control until the picture is stationary on the screen, using the same procedure used in adjusting the vertical hold control.

Centering Controls

These controls may be either electrical or mechanical.

If electrical controls are used, two controls—vertical position and horizontal position—are usually accessible to the owner. These controls should be adjusted until the picture is centered in the frame.

If mechanical controls are used, it will normally require a service man to adjust them.

Picture Height (Vertical Size)

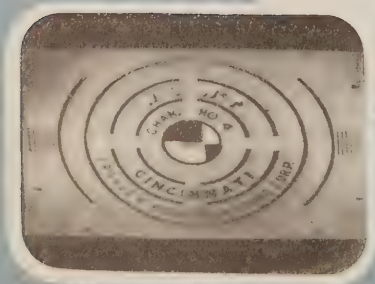
This control adjusts the vertical size of the picture. When picture height is adjusted, it is also necessary to adjust the vertical linearity control.

Picture Width (Horizontal Size)

This control adjusts the horizontal size of the picture. When picture width is adjusted, it is also necessary to adjust the horizontal linearity control.

Vertical and Horizontal Linearity Controls

These controls are used to get an undistorted picture. No attempts should be made to adjust them except when a test pattern is being transmitted. These controls are usually service-adjusted.



Owner-Operated Controls

Tuning Control

This control selects and tunes in the desired television station. This control should be operated in accordance with instructions received with the set. Receivers are usually tuned like FM receivers. If improperly tuned, the picture will look like illustrations at right, or will have fine herringbone lines. Both of these can be cured by readjusting the tuning control.

Tuning Control Misadjusted

Power Switch

This switch turns the set on or off. It is often combined with the sound volume control.

Volume Control

This controls sound volume of the receiver. It is used in the same way as the volume control on a radio.

Tone Control

This is the same as the tone control on the radio receiver.

Brightness Control

Determines the average illumination of the picture.

Sets illumination so that proportion of black and white is correct. Should be set to get as much shading as possible. If set too low—all blacks and grays are black. If set too high—retrace lines will appear.

Should be adjusted so that tiniest signal input will start screen brightening from total blackness.

Brightness Control Misadjusted

Contrast Control

The contrast control governs the relation between the lightest and darkest portion of the picture.

It operates as a "volume control on pictures." That is, the more input, the greater the contrast, within the limits of the system.

Shown at the right are pictures with Contrast and Brightness Controls misadjusted. In adjusting these controls, the procedure to follow is to—turn the Contrast Control clear back—turn the Brightness Control so that it is set just below the point where light is seen on the screen—then turn the Contrast Control so that the picture is as desired.

Contrast Control Set Too High

You Can Sell Better When You Know About...

merchandising Crosley television receivers

No matter how good a salesperson you are — you can sell BETTER when you back up your ability with an appreciation of effective television merchandising techniques such as outlined in this section. This, plus a thorough understanding of all the information in this manual, provides you with the background to really SELL Crosley television receivers.

Know Your Product

To sell television with enthusiasm you must have a good basic knowledge of it. You must be able to discuss it with customers in simple, understandable language. You must be prepared with facts so that you can overcome any sales objections and stimulate genuine interest in Crosley receivers. This manual has been prepared to give you the necessary basic knowledge so that you can talk every phase of television intelligently — so that you can inspire the confidence that creates a desire to buy from YOU. Study the facts in this manual carefully— read everything you can, on television in magazines, trade journals, etc. Keep your information organized so that you can do an effective selling job.

Know Your Programs

Be thoroughly familiar with the television programs that are received in your area. Know when programs of various types are on the air so that you are sure at all times what is available for demonstrations. This can be one of your most effective means of selling television to your prospects. Get your prospects to talk — find out their likes and dislikes — get on a friendly basis, to learn their specific interests. Now, sell the prospects by showing the programs that you feel will appeal most to them. Certain programs are extremely popular, so concentrate on them — let them help you sell Crosley television receivers.

Know Your Customers

Keep Sets Properly Adjusted

Receivers for demonstration should be, of course, hooked up properly with an efficient antenna installation for the best possible reception. But that's not enough to insure the most effective presentation. Make sure that all controls are properly adjusted *before* the demonstration. Your manual will show you how to make *minor* control adjustments. Thus, you will be all set to turn the "off-on" control for a bright, clear picture right at the start. *First* impressions are lasting impressions—therefore it is the prospect's first impression that will help make or break a sale.

Be A Good "Housekeeper"

Because television sets represent a sizable expenditure of family funds, they are glamorized in the store display. To sell such merchandise of a higher unit value good housekeeping is a "must." This means maintaining the best possible appearance of display models. Remove any accidental scratches. Sets should be dusted and polished regularly. See to it that the glass is kept clean. Every set should be treated with the same respect as a fine piece of furniture. Make a regular check to be sure that all sales literature, program listing, television magazines, and other promotional material is conveniently and neatly displayed, but not on top of the receivers.

Keep Up With Television Advertising And Publicity

As a live-wire salesman you should keep posted on what's new in television. Read the television ads in the local papers religiously—your own and those of your competitors. Read the ads in national magazines. Read the news articles in daily papers and popular magazines. Many of your prospects will have read the ads and news stories, and they will assume you have. Don't let them put you on the spot when they refer to them and ask questions. Be prepared with the answers. And turn those answers into reasons to buy Crosley television receivers.

Use Special Viewing Area

When television prospects come into the store get them into the special area provided for television demonstrations. Do it right away. Be sure there are chairs available so that you can invite customers to make themselves comfortable. Don't stand around talking television generally with the prospect out in the store. Find out what the prospect is interested in — show him the Crosley television receivers — then demonstrate. And here's an important point — don't talk while the set is receiving. Remember — the television receiver itself is your best sales ammunition.

Make Home Demonstrations Pay Off

There are times when, in spite of all other approaches, it is necessary to demonstrate a receiver in the prospect's home. Since careful preparation is necessary for an effective home demonstration, it is important that the job be done right.

PREPARATION: Plan the home demonstration in advance. Pick an evening when the programs that will have a special appeal for your prospect are presented. Use a good portable antenna and a Crosley television receiver already adjusted to the station you want to tune in.

When making home demonstrations it is wise to take a service engineer along if possible, to make sure that the pictures shown are the best it is possible to obtain with a temporary installation.

PRESENTATION: Place the television receiver in a convenient spot in the home where the family can view the pictures in complete comfort. Locate the receiver so that light from windows will not interfere with the viewing of the screen.

Build your sales story around the prospects' interests and needs. Demonstrate the hidden values of the receiver; show why it will do certain things better than any competitive product.

Don't forget the "kiddies" are extremely interested and enthusiastic. Play on this interest.

Dramatize all the features to the extent that the prospect will not be satisfied with any other make of receiver. If necessary, leave the receiver in the home on a trial basis, to the extent permitted by current regulations, *but call back as soon as possible.* In most cases you will find the set has become a part of the home — and the sale is ready to be closed.

Before leaving the set in the home make sure that the prospect is properly instructed as to its use. This will eliminate nuisance service calls.

Let The Children Help You Sell

It has been shown time and again that the children in a family exercise a tremendous influence in getting a television receiver into a home. Special effort should be made to invite children into the store to view children's programs.

A good idea is to invite them to attend in small groups at a specified time. Tickets can be issued and sent to the home, or passed out in the store. In the invitation, be sure to ask the child to bring his parents in for the television demonstration. Or, when children enter the store with their parents, they can be invited to see a television program while the parents are shopping. Suggest to the parents that they call for the children when they are ready.

After the demonstration, give the children copies of Crosley television literature suggesting that they show it to their parents. Program listings, with children's programs underlined, should also be given to them.

Help The Prospect Select The Right Model

There is a Crosley set for every need. So, ask questions and talk with the prospect, to find out these needs and sell accordingly.

If price is not of paramount importance to your prospect, it is wise to recommend a receiver with the largest size screen that will offer ideal viewing conditions where the set is to be located. Ideal viewing distance is ten times the height of the picture.

Usually, the prospect can readily decide which cabinet harmonizes best with the other furnishings in the home. However, when the decision is being made at the store, make sure the customer gives adequate consideration to this factor of selection.

Point out that Crosley cabinets are Carrollton fine furniture. Call attention to the beautiful styling. Stress the point that Crosley cabinets, designed in good taste, fit in with the beauty of any home.

Sell Crosley Prestige

Since people know very little about television, they rely on the reputation of the manufacturer of a television receiver. Crosley is a great name that stands for many great products. In addition, Crosley is a pioneer in television. Make a point of this fact to show prospects Crosley's place in the television field.

Crosley prestige satisfies old customers — attracts new ones. Don't miss an opportunity to make the most of the Crosley name behind you when you sell television sets.

Talk Up Service

Where a considerable amount of money is involved, people are anxious to make sure the money is going to be well spent. In the case of television, they are spending this money for a receiver in order to enjoy the programs that are being offered. They want the assurance that they will get the brightest, clearest pictures possible. They want the assurance that the installation will be efficient for continuous enjoyment of the programs. Therefore, an important factor in selling Crosley television sets is to impress the prospect with your complete service facilities that assure an efficient installation.

Call Back On Your Customers

Call backs on the customers who have purchased television receivers can pay big dividends. Such call backs should be made shortly after the receiver has been installed.

. . . to check operation

On these calls you check to see if the receiver is operating properly. You make sure the owner understands operation of the receiver thoroughly.

. . . to give additional information

You give the owner any interesting new information you may have, such as new programs, new stations being planned, etc.

. . . to build satisfied customers

By showing your interest in the customer's enjoyment of the television receiver you create one of the most effective advertising tools in selling —you create a customer who is completely satisfied and who is *sold* on *you* as well as the Crosley set.

. . . to secure list of prospects

Such a satisfied customer will "let the world know" about Crosley television sets and your organization. They will be your best boosters. From them you can secure many names of other people who are good prospects for Crosley television receivers.

Create Prospects Through Meetings

Interest in television is running at a very high peak. Everyone wants to know more about this all-important subject. With the information contained in this manual, plus supplementary reading in television publications, plus your required knowledge of the operation of television receivers, you can create additional prospects by talking on the subject of television to all kinds of church, civic, and other service groups. Rotary clubs, Kiwanis clubs, American Legions, Elks, and many other groups are all interested in learning more about television. This is an opportunity for you to put your knowledge to work building sales.

Check Time Payment Customers

Customers who are buying other appliances at your store on the time payment plan, should be put on your television prospect list. When they are about cleaned up on their payments arrange for a television demonstration. Since your store is on a friendly basis with these customers your approach should be to thank them for past business and to invite their continued enjoyment of Crosley products — in this case, a television receiver.

You Can Sell Better When You Know About...

installing and servicing the Crosley receiver

INSTALLATION

Select the Right Room Location

Impress the customer with the importance of selecting the right spot in the home for the television receiver.

In most cases, the determining factor will be the spot where the screen is visible to the largest number of people. Fitting the receiver into an existing furniture layout will, therefore, be a secondary consideration.

Receivers should be placed preferably against a dark background. They should not be placed against a window or between two windows.

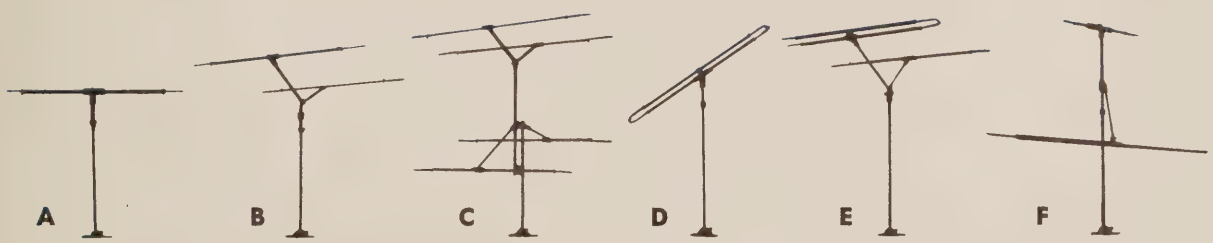
The ideal viewing distance is 10 times the height of the picture. This should be considered in locating the receiver.

Make sure the customer understands that the television receiver cannot be moved around as freely as a radio. Point out that changing the mind as to location will result in added expenses.

Select the Proper Antenna

The antenna is an important item for good television reception. Careful selection of the proper type is part of any good installation. Consideration should be given to various reception factors such as: possible interference conditions, weak signal areas, directions and distances of transmitters, multiple antenna installations such as on apartment buildings.

Crosley Teleflex Antennas are designed to meet various conditions. They are built to withstand wind, hail, sleet, and snow.



A. STRAIGHT DIPOLE—*for use in high signal strength, noise-free areas.*

B. STRAIGHT DIPOLE WITH REFLECTOR—*gives directivity. For use where there are "ghost" or noise conditions.*

C. STACKED DOUBLE DIPOLE WITH REFLECTOR—*for high gain.*

D. FOLDED DIPOLE—*For use at limit of service area.*

E. FOLDED DIPOLE AND REFLECTOR—*for use in areas where signal strength is low and interference is high.*

F. "COMBOS" HI-LOW ASSEMBLY — *combines high band antenna and a low band antenna.*

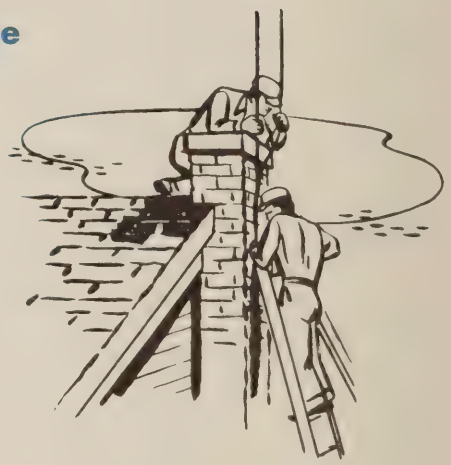
ADAPTER KITS—available for combining the reception of a higher band stand on an existing low band antenna.

Select the Proper Antenna Location

- Select a high place—away from street, electrical transmission wires, trolley wires, etc.
- Through trial and error, find place and direction which receives strongest signal from all stations in areas.
- Select a location where reflections, causing "ghosts," and fuzzy images, or where noises, are at a minimum.
- Use the proper antenna to overcome shortcomings of available locations, such as nearby high buildings, weak signal areas, etc.

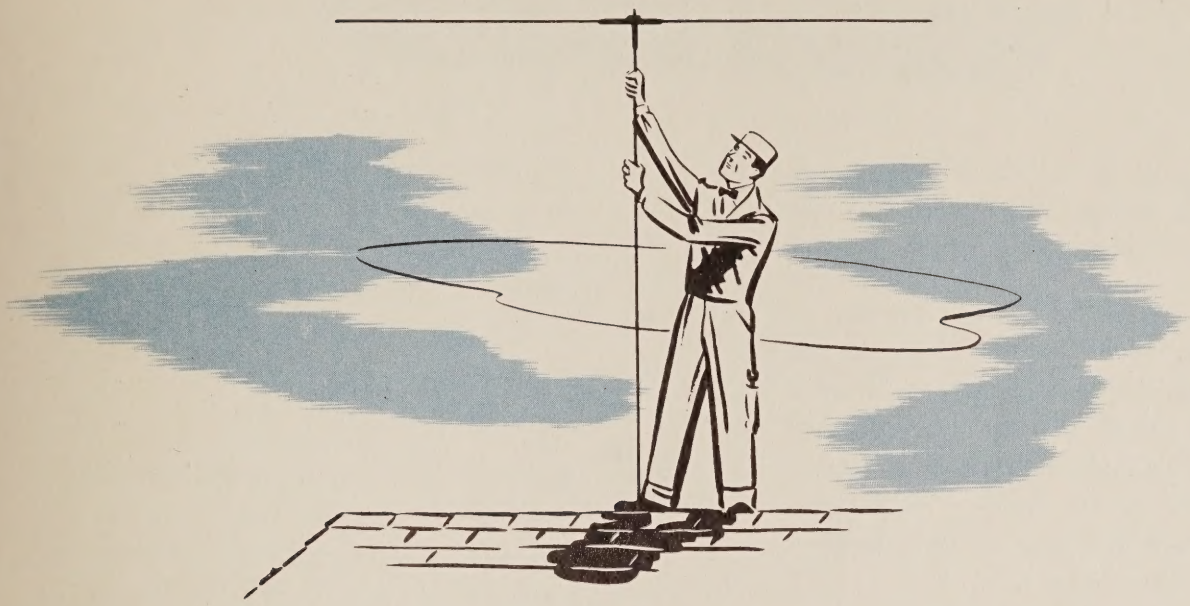
Install Transmission Line

- Use the most suitable Crosley Teleflex antenna.
- Transmission line standoffs are furnished to the mast.
- Transmission line is ready to install.
- Impedence in transmission line is matched to receive input impedence.



Adjust the Receiver for Normal Operation

- Adjust all the service-adjusted controls listed on page 26.
- Show the owner how to use all the manual controls described on page 27.
- Show the owner what a good pattern should look like. Then show a bad pattern—and show how to correct these bad patterns. Then have owner do it to make sure all instructions are clear.
- Check and double check before leaving to make sure that receiver is properly adjusted.
- Finally, ask owner if there are any questions. If so, answer them.



SERVICING CROSLEY RECEIVERS

Tips For Dealers and Dealer Salesmen

✔ A good working knowledge of television principles is, of course, important. Not only for answering customer questions, but also for intelligent presentation of the many features in which Crosley excels.

✔ Customers must be made to understand certain television limitations. Existing receivers, for instance, are capable of reproducing better pictures than present transmitters are able to send out. Point out also that in an area served by 4 or 5 stations, perhaps two of these will come in better than the others.

✔ The customer should be told the details of the service arrangements.

✔ Dealers who make installations should carry liability insurance — against falling antenna, dislodging objects from owner's roof, damage to owner's property during installations.

✔ Unless dealers have a competent service man and proper equipment for installations, they should get their distributors to handle their installation and service.

✔ Dealers should avoid regarding installation charges as an "extra" profit. Unless the installation is correct in every respect, subsequent adjustments (at the dealer's expense) can more than wipe out the legitimate profit on the sale of the receiver.

Tips for Crosley Television Service Men

- In servicing a Crosley receiver, always follow the Crosley Service Manual for that particular model.
- Never attempt an installation or repair job unless you are sure you understand the basic television principles, how the set works, what makes a good picture, and the proper procedures to follow. Haphazard installations result in complaints—dissatisfied users.
- When installing a set, always brief the owner on how to operate the controls. Show what poor patterns look like and how they are corrected. Explain to the owner what to expect in the way of receiver performance in the particular area.
- Immediately after a receiver is installed it should be inspected for perfect adjustments. This is important. If the receiver is properly adjusted originally, 90% of service "nuisance" calls can be avoided.

Put Yourself
in the
CROSLEY
television
picture

CROSLEY